

Remarks

Claims 1-3, 5, 20, 70-76, 78, 81, and 90-91 are pending in the application. Claims 4, 6-19, 27-69, 77, 79-89 have been canceled. Claims 1, 20-26, 78, and 81 have been amended. Claims 21-26 are species that have been withdrawn from consideration as being drawn to a non-elected species. No new matter has been added by virtue of this amendment. Reconsideration of the application as amended is requested.

Entry of this Amendment After Final Rejection

Applicant believes this amendment places the application in form for allowance. The amendment to claim 1 replaces a negative limit (not shadowing) with a positive formulation of the same idea (transmitted). Amendments to other claims fix problems raised by the examiner. Thus, applicant believes that this amendment does not raise new issues for consideration, examination or search. Thus, applicant requests entry of this amendment.

Claim Objections

Claims have been amended to fix antecedent basis and dependency issues cited by the Examiner.

Allowable Claims

Applicant wishes to thank the Examiner for the allowance of claims 3, 70-72, 76, 78, and 90 if rewritten as independent claims. However, applicant believes that claim 1, as slightly amended herein, will also be allowable and will make all claims allowable.

Claim Rejections--35 U.S.C. § 102

The Examiner rejects claims 1, 2, and 75 under 35 U.S.C. § 102(b), as being anticipated by Greenaway.

Claim 1 provides:

- e) illuminating said object mask with said illumination beam, wherein said illumination beam directed along said axis causes said object mask to allow said transmitted undiffracted reference wavefronts to pass

therethrough to reach reach said area, and wherein said illumination beam directed along said axis causes said one or more substantially transparent elements to create said object wavefronts which interact with said undiffracted reference wavefronts to create an interference pattern at said area; and

- f) recording said interference pattern in at least said area of said holographic recording medium.

First, Greenaway does not teach or suggest "illuminating said object mask with said illumination beam, wherein said **illumination beam directed along said axis causes said object mask to allow said transmitted undiffracted reference wavefronts to pass therethrough.**" Greenaway gives five alternative approaches which all avoid shining light on the object mask and allowing undiffracted reference wavefronts to pass through the object mask.

Greenaway gives five alternate ways of getting the reference wavefronts to the holographic recording medium without any of them being transmitted through the object mask are:

- (1) beam splitter 102, 402 in FIGS. 1 and 4.
- (2) large lens 206, 412 in FIGS. 2 and FIG. 4 to provide "active area (annulus)" on "holgram plate" 214 in FIG. 2 and in FIG. 4.
- (3) large parabolic mirror 500 to provide a similar annular active area in FIG. 5.
- (4) wide annular prism 600 to provide reference beam in an annular region around object transparency 610 in FIG. 6.
- (5) annular active region 708, 802 in FIGS. 7, and 8.

Thus, Greenaway finds ways to avoid the limit of the present invention and does not teach or suggest that the "illumination beam directed along said axis causes said object mask to allow said **transmitted undiffracted reference wavefronts to pass therethrough.**" This is true regardless of the shape of the holographic recording medium.

Second, Greenaway does not teach or suggest "recording said interference pattern in at least said area of said holographic recording medium" where the area is one accessible by "**transmitted undiffracted reference wavefronts**" that **pass through** the object mask. Greenaway only records an interference pattern in the annular region of the holographic recording medium surrounding the central region that uses undiffracted reference wavefronts **that are not transmitted and do not pass through** the object mask.

Thus, the rejection of claim 1, and claims dependent thereon, under 35 U.S.C. § 102(b), as being anticipated by Greenaway has been traversed.

With regard to claim 2, the Examiner states that "one of the transparent elements is a diffuser, which fairly constitutes a 'scattering element.'"

However, applicant would respectfully ask the Examiner to consider that Greenaway's diffuser prevents undiffracted reference wavefronts from reaching the area of the holographic recording medium. In Greenaway the only undiffracted reference wavefronts that reach the holographic recording medium are ones that are **not transmitted** through the object mask. In Greenaway, the only undiffracted reference wavefronts that reach the holographic recording medium are ones that go past the object mask, and that is why Greenaway's recording is only in an annular region. Claim 1, and claims dependent thereon, including claim 2, however, are clearly distinguished from the teachings and suggestions of Greenaway because claim 1 includes: "illumination beam directed along said axis causes said object mask to allow said **transmitted** undiffracted reference wavefronts to **pass therethrough**."

With regard to claim 75, the Examiner states that "the interference pattern is recorded in a continuous annular 'active area' of the hologram plate (214) to form a 'continuous diffracting region.'" However, the fact that Greenaway's interference pattern is only in the annular active area is because Greenaway does not teach or suggest the limit of Claim 1, "illumination beam directed along said axis causes said object mask to allow said **transmitted** undiffracted reference wavefronts to **pass therethrough**." Thus, claim 1, and claims dependent thereon, including claim 75 are clearly distinguished from the teachings and suggestions of Greenaway.

Claim Rejections--35 U.S.C. § 103

The Examiner rejects claims 20/2, 5, 73 and 74 under 35 U.S.C. § 103(a), as being unpatentable over Greenaway. The Examiner states that "Greenaway does not expressly identify the one or more transparent elements in the embodiment of Figure 2 as phase-altering elements which are indentations in the object mask (claim 20/2) and does not disclose an array of transparent elements (claim 5). Rather Greenaway discloses a transparent element as being a diffuser." As to claims 73 and 74 the Examiner states that "Greenaway does not disclose an optical density between 0.1 and 5.0 (claim 73) and does not disclose a beam intensity ratio between 0.1:1-100:1 (claim 74)." The Examiner then notes that "Nonetheless, Greenaway discloses the substantially planar regions of annular attenuator (210) as comprising a semi-transparent metal layer. It will be appreciated that, in order to attenuate the beam, such a layer inherently has some optical density. Further Greenaway teaches that the purpose of the annular attenuator is to provide the 'optimum ratio' between the reference and object beam intensities. Thus, in practicing the invention of Greenaway, it appears that one of ordinary skill would have arrived at an optical density (of the attenuator) between 0.1 and 5.0 through only routine experimentation in the process of providing an optimum attenuation that provides the optimum beam

intensity ratio, as suggested by Greenaway. Further, barring any unexpectedly improved result arising from the particular selection of a beam intensity ratio laying between 0.1:1 - 100:1, it appears that one of ordinary skill would have arrived at such a ratio, through only routine experimentation in discovering the 'optimum' ratio discussed by Greenaway."

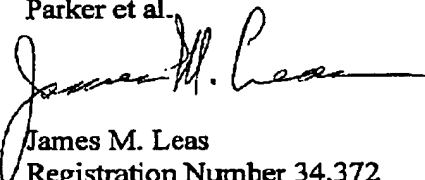
However, the fact that Greenaway's interference pattern is only in the annular active area is because Greenaway does not teach or suggest the limit of Claim 1, "illumination beam directed along said axis causes said object mask to allow said transmitted undiffracted reference wavefronts to pass therethrough." Thus, claim 1, and claims dependent thereon, including claims 20/2, 5, 73 and 74 are clearly distinguished from the teachings and suggestions of Greenaway.

The Examiner rejects claim 91 under 35 U.S.C. § 103(a), as being unpatentable over Greenaway in view of Graham. The Examiner states that Greenaway does not disclose the semi-transparent layer as particularly being chrome," and that Graham teaches that chrome was well-known for use in a semi-transparent layer that provides optical attenuation. However, neither Greenaway nor Graham teach the limits of claim 1, as amended, as described herein above, and therefore claim 91 and other claims dependent on claim 1 should be allowable.

It is believed that the claims are in condition for allowance. Therefore, applicant respectfully requests favorable reconsideration. If there are any questions please call applicant's attorney at 802 864-1575.

Respectfully submitted,

For: Parker et al.

By: 
James M. Leas
Registration Number 34,372
Tel: (802) 864-1575

James M. Leas
37 Butler Drive
S. Burlington, Vermont 05403